Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1-15. (Canceled)

16. (Previously Presented) A process for controlled radical polymerization using an organosulfur reversible chain transfer agent which consists in preparing polymers having a number-average molar weight of greater than 100,000 g/mol, said polymer having a polydispersity index of less than 1.2 for number-average molar weights in the range of 100,000 to 200,000 g/mol and a polydispersity index of less than 1.4 for number-average molar weights of greater than 200,000 g/mol, with a degree of conversion of monomer of greater than 75% and a polymerization time of less than 8 h, said process comprising controlling the flux of initiator radicals in the polymerization medium.

17. (Previously Presented) The polymerization process as claimed in claim 16, wherein the control of the flux of initiator radicals is achieved by the stages consisting in:
i) maintaining a uniform polymerization temperature T_1 during the initiation period, and
ii) continuing the polymerization, the polymerization temperature being allowed to fall to the temperature T_2,
it being understood that T_1 and T_2 correspond to the following equations (1) and (2):

$T_1 > T_2$ (1) and

$T_1 - T_2 \leq 50°C$ (2).

18. (Previously Presented) The polymerization process as claimed in claim 17, wherein T_1 is between 60 and 95°C.

19. (Previously Presented) The polymerization process as claimed in claim 17, wherein T_2 is between 40 and 75°C.

20. (Previously Presented) The polymerization process as claimed in claim 17, wherein T_1 is equal to 80°C and T_2 is equal to 60°C.

21. (Previously Presented) The polymerization process as claimed in claim 18, wherein the monomers are monomers derived from acrylamide.

22. (Previously Presented) The polymerization process as claimed in claim 17, wherein the chain transfer agent is tert-butyl dithiobenzoate.

23. (Previously Presented) The polymerization process as claimed in claim 17, wherein the initiating agent is azobisisobutyronitrile.

24. (Previously Presented) The polymerization process as claimed in claim 16, wherein the control of the flux of initiator radicals is achieved by the use of an initiating agent having a decomposition rate constant which is greater than that of azobisisobutyronitrile at the uniform temperature under consideration.

25. (Previously Presented) The polymerization process as claimed in claim 24, wherein the initiating agent is 2,2'-azobis(2,4-dimethylvaleronitrile).

26. (Previously Presented) The polymerization process as claimed in claim 24, wherein the polymerization is carried out at uniform temperature.

27. (Previously Presented) The polymerization process as claimed in claim 24, wherein the monomers are monomers derived from acrylamide.

28. (Previously Presented) The polymerization process as claimed in claim 24, wherein the chain transfer agent is tert-butyl dithiobenzoate.

29–30. (Canceled)